**Amendments to the Claims:**

1. (Currently Amended) In a variable bandwidth wireless communication system communicating under multiple different communication schemes that each have a different bandwidth, a process performed by a base station of generating an information bearing signal for wireless transmission, the process comprising:

utilizing by the base station a number of subcarriers to construct a variable bandwidth wireless channel;

utilizing by the base station groups of subcarriers, wherein each group includes a plurality of subcarriers;

maintaining a fixed spacing between adjacent subcarriers;

adding or subtracting, by the base station, groups of subcarriers to scale the variable bandwidth wireless channel and achieve an operating channel bandwidth; and

wherein a core-band, including a plurality of subcarrier groups, substantially centered at an operating center frequency of the different communication schemes, is utilized by the base station as a broadcast channel carrying radio control and operation signaling, where the core-band is substantially not wider than a smallest possible operating channel bandwidth of the system wherein the core-band further includes a primary preamble that is sufficient to enable radio operations, the primary preamble being a direct sequence in the time domain with a frequency content confined within the core-band or being an OFDM symbol corresponding to a particular frequency pattern within the core-band, wherein one or more side-bands are utilized by the base station to communicate an auxiliary preamble that is combinable with the primary preamble to form a full-bandwidth preamble, the auxiliary preamble being either a direct sequence in the time domain with a frequency response combined within the one or more side-bands or being an OFDM symbol corresponding to a particular

frequency pattern within the one or more side-bands, and wherein a bandwidth of the one or more side-bands is the difference between a bandwidth of the core-band and the operating channel bandwidth.

2. (Previously Presented) The process of claim 1, wherein the information bearing signal is:

an orthogonal frequency division multiple access (OFDMA) signal; and is

utilized in a downlinkwith a duplexing technique that is either Time Division Duplexing (TDD) or Frequency Division Duplexing (FDD).

3-5. (Canceled)

6. (Currently Amended) In a variable bandwidth communication network of base stations and mobile stations, wherein a signal comprises groups of subcarriers and each group includes a plurality of subcarriers, a method performed by a mobile station comprising:

maintaining a fixed spacing between adjacent subcarriers;

adjusting a number of groups of subcarriers to scale a channel and attain an operational bandwidth;

utilizing a core-band, substantially centered at an operating center frequency to carry synchronization information, wherein the core-band is narrower than or equal to a smallest possible operating channel bandwidth of the network and includes a primary preamble sufficient to enable radio operations, the primary preamble including a direct sequence in the time domain with a frequency content confined within the core-band or including an OFDM symbol corresponding to a particular frequency pattern within the core-band;

utilizing one or more side-bands to carry an auxiliary preamble that is combinable with the primary preamble to form a full-bandwidth preamble, the auxiliary

preamble including either a direct sequence in the time domain with a frequency response combined within the one or more side-bands or including an OFDM symbol corresponding to a particular frequency pattern within the one or more side-bands; and

scanning spectral bands of different center frequencies and detecting the synchronization information in the core-band of the operating center frequency and decoding a broadcast channel carrying radio control and operation signalling provided by a base station to the mobile station via the core-band, wherein a bandwidth of the one or more side-bands is the difference between a bandwidth of the core-band and the operational bandwidth.

7. (Canceled)

8. (Previously Presented) The method of claim 6, wherein the signal is an orthogonal frequency division multiple access (OFDMA) signal, and the signal is utilized in a downlink with a duplexing technique that is either Time Division Duplexing (TDD) or Frequency Division Duplexing (FDD).

9. (Canceled)

10. (Canceled)

11. (Currently Amended) In a variable bandwidth communication network wherein a communication signal utilizes groups of subcarriers, wherein each group comprises a plurality of subcarriers, and a mobile station has an adaptable bandwidth, the mobile station comprising:

an analog-to-digital converter for signal sampling;

a Fast Fourier Transform and Inverse Fast Fourier Transform processor (FFT/IFFT), wherein a fixed spacing between adjacent subcarriers is maintained;

a scanner for scanning spectral bands of specified center frequencies;

a facility for decoding a broadcast channel including radio control and operation signalling associated with the area in a core-band including a plurality of groups, wherein the core-band is not wider than a smallest possible operating channel bandwidth of the network; and

a facility for adding groups to widen the channel bandwidth for remainder of the communication, wherein the communication signal further utilizes the core-band for communicating a primary preamble sufficient to enable radio operations, the primary preamble being a direct sequence in the time domain with a frequency content confined within the core-band or being an OFDM symbol corresponding to a particular frequency pattern within the core-band, wherein the communications signal further utilizes one or more sidebands for communicating an auxiliary preamble that is combinable with the primary preamble to form a full-bandwidth preamble, the auxiliary preamble being either a direct sequence in the time domain with a frequency response combined within the one or more side-bands or being an OFDM symbol corresponding to a particular frequency pattern within the one or more side-bands, and wherein a bandwidth of the one or more side-bands is the difference between a bandwidth of the core-band and the adaptable bandwidth.

12. (Canceled)

13. (Previously Presented) The mobile station of claim 11, wherein the communication signal is an orthogonal frequency division multiple access (OFDMA)

signal, and the communication signal is utilized in a downlink with a duplexing technique that is either Time Division Duplexing (TDD) or Frequency Division Duplexing (FDD).

14-21. (Canceled)

22. (Currently Amended) A cellular base station comprising:

circuitry configured to transmit a broadcast channel in an orthogonal frequency division multiple access (OFDMA) core-band, wherein the core-band is substantially centered at an operating center frequency and the core-band includes a first plurality of subcarrier groups, wherein each subcarrier group includes a plurality of subcarriers, wherein the core-band is utilized to communicate a primary preamble sufficient to enable radio operations, the primary preamble being a direct sequence in the time domain with a frequency content confined within the core-band or being an OFDM symbol corresponding to a particular frequency pattern within the core-band; and

circuitry configured to transmit control and data channels using a variable band including a second plurality of subcarrier groups, wherein the variable band includes at least the core-band and one or more side-bands, wherein the or more sidebands are utilized to communicate an auxiliary preamble that is combinable with the primary preamble to form a full-bandwidth preamble, the auxiliary preamble being either a direct sequence in the time domain with a frequency response combined within the one or more side-bands or being an OFDM symbol corresponding to a particular frequency pattern within the one or more side-bands, and wherein a bandwidth of the one or more side-bands is the difference between a bandwidth of the core-band and an operating bandwidth.

23. (Previously Presented) The cellular base station of claim 22 wherein the circuitry configured to transmit the broadcast channel is further configured to transmit radio network information in the broadcast channel.

24. (Previously Presented) The cellular base station of claim 22 further comprising circuitry configured to transmit synchronization information in the core-band.

25. (Previously Presented) The cellular base station of claim 22 wherein the circuitry configured to transmit the broadcast channel is further configured to transmit in a time slot format.

26. (Previously Presented) The cellular base station of claim 22 wherein the base station operates in an OFDMA frequency division duplex (FDD) or time division duplex (TDD) mode.

27. (Currently Amended) A cellular mobile station comprising:

circuitry configured to receive synchronization information from a base station in an orthogonal frequency division multiple access (OFDMA) core-band, wherein the core-band is substantially centered at an operating center frequency and the core-band includes a first plurality of subcarrier groups where each subcarrier group includes a plurality of subcarriers, wherein the core-band is utilized to communicate a primary preamble sufficient to enable radio operations, the primary preamble being a direct sequence in the time domain with a frequency content confined within the core-band or being an OFDM symbol corresponding to a particular frequency pattern within the core-band;

circuitry configured to synchronize with the base station using the received synchronization information; and

circuitry configured to receive control and data channels using a variable band including a second plurality of subcarrier groups, wherein the variable band includes at least the core-band and one or more side-bands, wherein the or more sidebands are utilized to communicate an auxiliary preamble that is combinable with the primary preamble to form a full-bandwidth preamble, the auxiliary preamble being either a direct sequence in the time domain with a frequency response combined within the one or more side-bands or being an OFDM symbol corresponding to a particular frequency pattern within the one or more side-bands, and wherein a bandwidth of the one or more side-bands is the difference between a bandwidth of the core-band and an operating bandwidth.

28. (Previously Presented) The cellular mobile station of claim 27 wherein the circuitry configured to receive the synchronization information from the base station in the core-band is further configured to receive the cell identification information from the base station in the core-band.

29. (Previously Presented) The cellular mobile station of claim 27 further comprising circuitry configured to receive a broadcast channel in the core-band.

30. (Previously Presented) The cellular mobile station of claim 29 wherein the broadcast channel carries radio network information.

31. (Previously Presented) The cellular mobile station of claim 27 further comprising circuitry configured to transmit a preamble after synchronizing with the base station.

32. (Currently Amended) A variable bandwidth communication method comprising:

transmitting a broadcast channel by a cellular base station in an orthogonal frequency division multiple access (OFDMA) core-band, wherein the core-band is substantially centered at an operating center frequency and the core-band includes a first plurality of subcarrier groups, wherein each subcarrier group includes a plurality of subcarriers, wherein the core-band is utilized to communicate a primary preamble sufficient to enable radio operations, the primary preamble being a direct sequence in the time domain with a frequency content confined within the core-band or being an OFDM symbol corresponding to a particular frequency pattern within the core-band; and

transmitting control and data channels by the cellular base station using a variable band including a second plurality of subcarrier groups, wherein the variable band includes at least the core-band and one or more side-bands, wherein the or more sidebands are utilized to communicate an auxiliary preamble that is combinable with the primary preamble to form a full-bandwidth preamble, the auxiliary preamble being either a direct sequence in the time domain with a frequency response combined within the one or more side-bands or being an OFDM symbol corresponding to a particular frequency pattern within the one or more side-bands, and wherein a bandwidth of the one or more side-bands is the difference between a bandwidth of the core-band and an operating bandwidth.

33. (Previously Presented) The method of claim 32 wherein the broadcast channel carries radio network information.

34. (Previously Presented) The method of claim 32 further comprising transmitting by the base station synchronization information in the core-band.

35. (Previously Presented) The method of claim 32 wherein the transmissions are in a time slot format.

36. (Previously Presented) The method of claim 32 wherein the cellular base station operates in an OFDMA frequency division duplex (FDD) or time division duplex (TDD) mode.

37. (Currently Amended) A variable bandwidth communication method comprising:

receiving synchronization information by a cellular mobile station from a base station in an orthogonal frequency division multiple access (OFDMA) core-band, wherein the core-band is substantially centered at an operating center frequency and the core-band includes a first plurality of subcarrier groups where each subcarrier group includes a plurality of subcarriers, wherein the core-band is utilized to communicate a primary preamble sufficient to enable radio operations, the primary preamble being a direct sequence in the time domain with a frequency content confined within the core-band or being an OFDM symbol corresponding to a particular frequency pattern within the core-band;

synchronizing the cellular mobile station with the base station using the received synchronization information; and

receiving control and data channels by the cellular mobile station using a variable band including a second plurality of subcarrier groups, wherein the variable band includes at least the core-band and one or more side-bands, wherein the or more sidebands are utilized to communicate an auxiliary preamble that is combinable with the primary preamble to form a full-bandwidth preamble, the auxiliary preamble being either a direct sequence in the time domain with a frequency response combined within the one or more side-bands or being an OFDM symbol corresponding to a

particular frequency pattern within the one or more side-bands, and wherein a bandwidth of the one or more side-bands is the difference between a bandwidth of the core-band and an operating bandwidth.

38. (Previously Presented) The method of claim 37 wherein the receiving of the synchronization information by the cellular mobile station from the base station in the core-band includes receiving cell identification information from the base station in the core-band.

39. (Previously Presented) The method of claim 37 further comprising receiving by the cellular mobile station a broadcast channel in the core-band.

40. (Previously Presented) The method of claim 39 wherein the broadcast channel carries radio network information.

41. (Previously Presented) The method of claim 37 further comprising transmitting by the cellular mobile station a preamble after synchronizing with the base station.